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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/985,853	11/06/2001	Kazunori Ozawa	Q67063	4465

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EXAMINER

SKED, MATTHEW J

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 05/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/985,853

Applicant(s)

OZAWA, KAZUNORI

Examiner

Matthew J Sked

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/21/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-13 is/are rejected.
- 7) ☒ Claim(s) 7 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), filed 1/28/02, which papers have been placed of record in the file.
2. The objection to claim 6 is withdrawn in view of the amendment.
3. The rejection under 35 U.S.C. 112 is withdrawn in view of the amendment.
4. Applicant's arguments with respect to claims 1-5 and 8-12 have been considered but are moot in view of the new ground(s) of rejection.

Information Disclosure Statement

5. The information disclosure statement filed 01/08/04 has been considered (initialed) and enclosed. It is noted that the IDS of 1/28/02 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. Specifically, the Japanese article to Sugamura et al. has been lined through by the Examiner as not being considered.

Claim Objections

6. Claim 13 is objected to because of the following informalities: lines 2-3 should be changed from "so as to a reproduction speech signal" to --so as to produce a reproduction speech signal--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

8. Claims 1, 6, 8 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite, "A speech decoder for decoding a coded speech signal into a reproduction speech signal" and using this reproduction speech signal to produce a speech signal. By definition a "reproduction speech signal" is a decoded speech signal and so it is unclear why this speech signal is being used to reproduce another speech signal. For the purposes of examination it will be assumed that the reproduction speech signal is a demultiplexed coded signal that will be used to determine a synthesized speech signal.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 3-5, 8, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paksoy et al. (U.S. Pat. Pub. 2002/0052738).

As per claims 1 and 8, Paksoy teaches a speech decoder for decoding a coded speech signal into a reproduction speech signal and for reproducing a speech signal using the reproduction speech signal, including:

a spectral parameter calculating circuit, responsive to the reproduction speech signal, for calculating spectral parameters based on the reproduction speech signal (decodes LP coefficients from the decoded highband code bits, paragraph 67 and Fig. 1c);

an excitation signal calculating circuit for calculating an excitation signal and for obtaining a level of the excitation signal, on the basis of the reproduction speech signal and the spectral parameters calculated by the spectral parameter calculating circuit (generates the highband pitch-modulated excitation waveform from the LP coefficients, paragraph 69 and Fig. 1c);

a smoothing circuit responsive to the spectral parameters and the excitation signal, for smoothing in time the level of the excitation signal (smoothes the excitation waveform depending on a smoothing factor calculated from the spectral parameters, paragraphs 63-66 and 69); and

a synthesis filter circuit having a synthesis filter constructed with the spectrum parameters, and for synthesizing the excitation signal by using the synthesis filter, so as to reproduce the speech signal (synthesizes the smoothed excitation using the LP coefficients, paragraph 72);

wherein the excitation signal calculating circuit, the smoothing circuit and the synthesis filter circuit operate in compliance with only predetermined conditions (the excitation, smoothing and synthesizing only operate on highband signals, paragraphs 67-72).

Paksoy does not specifically teach the smoothing circuit outputs both the spectral parameters and the excitation signal. However, this would be a matter of designer's choice. As specified by the claims the smoothing circuit is responsive to both LP coefficients and the excitation signal where it smoothes the excitation signal based upon the LP coefficients. Here only the smoothed excitation signal is fed from the smoothing circuit to the synthesis circuit while the LP coefficients that are used in synthesis are fed directly from the parameter calculating circuit. So, as long as both the LP coefficients and the smoothed excitation signal are fed to the synthesizer the inventive nature of the claims are met. Feeding the excitation and parameters from the smoothing circuit as opposed to sending the parameters from the calculating unit would not solve any previous deficiencies or problems in the art.

11. As per claim 3 and 10, Paksoy teaches a mode-judging unit for judging the mode of the reproduction signal by extracting feature quantities from the reproduction speech signal (smoothes and synthesizes only the highband sections of the signal hence there would inherently be a determination if the signal is highband or lowband, paragraph 46) and the remaining sections only operate when a certain condition is met (the excitation, smoothing and synthesizing only operate on highband signals, paragraphs 67-72).

12. As per claims 4 and 11, Paksoy teaches the predetermined mode to be silence (determines if the signal is highband or lowband and a lowband signal would be noise and noise implies no speech, paragraph 46).

13. As per claims 5 and 12, Paksoy teaches the predetermined mode to be unvoiced sound (determines if the signal is highband or lowband and a lowband signal would be unvoiced, paragraph 46).

14. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paksoy as applied to claims 1 and 8 above, and further in view of Kroon et al. (U.S. Pat 5,732,389).

As per claims 2 and 9, Paksoy does not specifically teach the excitation calculation unit to carry out inverse-filtering for the reproduction speech signal by the use of spectral parameters to calculate the excitation signal.

Kroon teaches the excitation calculation unit to carry out inverse-filtering for the reproduction speech signal by the use of spectral parameters to calculate the excitation signal (synthesized speech is inverse filtered, col. 29, lines 45-46).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Paksoy to carry out inverse-filtering for the reproduction speech signal by the use of spectral parameters to calculate the excitation signal as taught by Kroon because it would enhance the formant regions in the reconstructed speech and overcome energy scaling problems.

Allowable Subject Matter

15. Claims 6, 7, 13 and 14 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

16. The following is a statement of reasons for the indication of allowable subject matter: Claims 6 and 13 recite the combination of a calculating the spectral parameters of the reproduction speech signal, calculating an excitation signal from the spectral parameters and the reproduction speech signal, calculating a residual signal from by subtracting a pitch prediction signal, calculated from the pitch period, from the excitation signal, calculating the gain of the pitch prediction signal or residual signal, smoothing the spectral parameters or the gain and outputting both and synthesizing a new excitation signal from the excitation signal, gain, pitch prediction signal and residual signal.

17. Ehara teaches a speech decoder for decoding a coded speech signal into a reproduction speech signal and for reproducing a speech signal by the use of the reproduction speech signal, including:

a spectral parameter calculating circuit, responsive to the reproduction speech signal, for calculating spectral parameters based on the reproduction speech signal (LPC decoder determines the LPCs from the demultiplexed code, paragraph 44);

an excitation signal calculating circuit for calculating an excitation signal and for obtaining a level of the excitation signal, on the basis of the reproduction speech signal and the spectral parameters calculated by the spectral parameter calculating circuit

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(generates a random codebook vector based upon the input code and the mode determined by the spectral parameters, paragraph 45 and 46);

a pitch-prediction circuit which calculates a pitch period from either the reproduction speech signal or the excitation signal, carries out a pitch prediction by the use of pitch period to produce a pitch prediction signal (generates an adaptive code vector by decoding the demultiplexed adaptive codebook index, paragraph 47), suggests calculating a residual signal by subtracting the pitch prediction signal from the excitation signal (adds the adaptive code vector and random code vector which would mathematically similar to subtraction, paragraph 49);

a gain-calculating circuit (gain codebook, paragraph 48); and

a synthesis filter circuit having a synthesis filter constructed with the spectrum parameters (paragraph 50) and for newly producing an excitation signal as a proper excitation signal on the basis of the gain, the pitch prediction signal and the residual signal, and thereby for synthesizing the proper excitation signal by using the synthesis filter, so as to reproduce the speech signal (paragraph 50).

Ehara does not teach a gain-calculating circuit for calculating a gain of at least one of the pitch prediction signal and the residual signal both output from the pitch-prediction circuit and a smoothing circuit responsive to the spectral parameters and the gain, for smoothing in time at least one of the spectral parameters and the gain, so as to output the spectral parameters and the excitation signal where at least one is subjected to smoothing.

Hayata (U.S. Pat. 5,787,388) teaches a decoding system with a smoothing unit for smoothing the spectral parameters but does not teach the smoothing unit is responsive to both spectral parameters and gain and does not teach a gain calculating circuit.

Kroon et al. (U.S. Pat. 5,732,389) teaches a decoding system with a gain calculating unit that calculates the gain of the signal from the excitation signal using a predicted pitch delay (compute gain from residual signal, col. 30, lines 2-5 and lines 30-33) but does not teach a smoothing unit responsive to the gain and spectral parameters.

It would not have been obvious to one of ordinary skill in the art at the time of invention to modify the systems given in order to arrive at the applicant's invention.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tasaki (U.S. Pat. 6,526,378) and Tasaki et al. ("Post Noise Smoother to Improve Low Bit Rate Speech-Coding Performance") teach post-processing systems to be used after decoding to smooth the signal.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Ometz can be reached on (571)272-7593. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER